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Do Deficits Cause Inflation?

The 1980s in the United States have been a decade of large federal budget deficits and high interest rates. Many analysts have interpreted the high market interest rates as evidence of high real, or inflation-adjusted rates, arguing that the large volume of federal borrowing has pushed up the price of credit. Other analysts, however, have attributed the high interest rates to investors' expectations of higher inflation in the future. These analysts believe investors expect the large budget deficits eventually to lead to high rates of inflation, not because the deficits in themselves are inflationary, but because the deficits will lead the Federal Reserve to adopt an inflationary monetary policy. In this *Letter,* we examine two potential links between budget deficits and monetary policy that have figured prominently in recent discussions: interest rate smoothing and fiscal dominance.

Interest rate smoothing

Many observers have noted that the Federal Reserve frequently conducts monetary policy in a way that stabilizes short-term interest rate movements. In the 1970s, for example, the Fed employed a federal funds rate operating procedure which tended to dampen short-run fluctuations in market interest rates. At present, moreover, the Fed implements monetary policy through control over borrowed reserves, an approach that is very similar in its effects to the federal funds rate procedure used earlier.

A policy that smooths interest rate movements, however, has the potential to be inflationary, particularly in an environment of rising real interest rates. A variety of factors can put upward pressure on real interest rates, including increases in the demand for credit associated with larger government budget deficits. To the extent that the monetary authority attempts to smooth interest rates and resist this upward pressure on interest rates, it will persistently increase the money supply. The faster growth in money, if sustained, will, in turn, push up the rate of inflation.

Thus, to the extent financial market participants believe that a smoothing policy will induce the monetary authority to resist interest rate pressures caused by higher fiscal deficits, they will expect higher inflation in the future. Higher inflationary expectations will then put upward pressure on market rates, particularly long-term interest rates.

Fiscal dominance

This sequence of events is essentially a story about the short-run relationship between deficits and inflation. Economists Thomas Sargent and Neil Wallace have emphasized that in the long-run, the actions of the monetary and fiscal authorities are related in a more fundamental way through the government's budget constraint. In the short-run, an excess of expenditures over tax revenues can be financed through the issuance of debt or the printing of new money. Presumably, however, the government eventually must pay off its debt. Sargent and Wallace show that the debt ultimately must be paid off either by increasing tax revenues relative to expenditures (that is, running budget surpluses in the future) or by printing more money. When taxes are insufficient to pay off the government's debt, it will be done by printing more money.

This view of the relationship between deficits and inflation assumes "fiscal dominance," that is, it assumes that the fiscal authority is the dominant political force, and the monetary authority reacts passively to the deficits determined by fiscal policy. Once the fiscal authority sets expenditures and taxes, the monetary authority is forced to finance any resulting deficit by creating new money.

However, the government's budget constraint does not imply that fiscal deficits always will lead to higher inflation. A politically dominant monetary authority could determine the rate of money growth, and force the fiscal authority to adjust taxes, expenditures, or both, to conform to the budget constraint.

In considering the implications of this theory, it is useful to keep in mind that the budget constraint actually restrains only the long-run behavior of the fiscal and monetary authorities. The short-run behavior of the monetary authority is not directly circumscribed in any way. Thus, fiscal dominance and interest rate smoothing both could operate to produce a positive association between budget deficits and inflation.

Evidence from hyperinflations

Interesting evidence on deficits and inflation can be obtained by examining the experiences of countries that have incurred very large budget deficits in the past. In Germany, Austria, Hungary, and Poland after the first World War, for example, the disruptions and devastations of the war left the governments in these countries with large expenditure needs and few revenue sources. As a result, each ran deficits that frequently were as large as total revenues. In other words, as much as half of all government expenditures in these countries following World War I was financed by borrowing.

Sargent has studied each of these countries' experiences and has found that in each case, the central bank was the primary purchaser of government debt in this period. This resulted in rapid increases in the stock of each economy's monetary base. In Austria, for example, central bank notes increased by a factor of 39 between January 1921 and August 1922. From January 1922 to August 1923, the German Reichsbank's notes in circulation increased by a factor of almost 6,000!

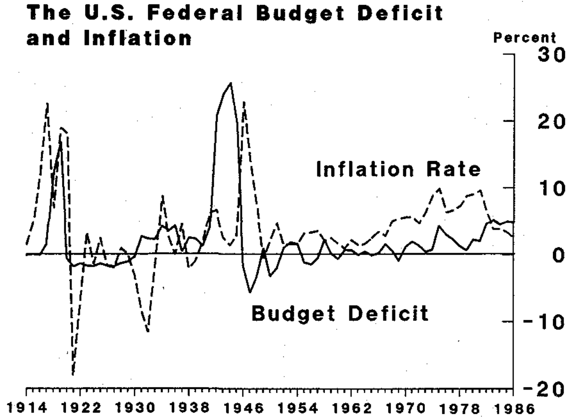
Forced to rely on printing money to finance government expenditures, these countries experienced astronomically high levels of inflation. In Germany, which suffered the worst inflation of the four countries, the price level increased by a factor of over 25,000 in the period from January 1922 until August 1923.

These episodes provide clear examples in which fiscal deficits led to inflation. Unable to raise sufficient revenue from tax sources, governments in these countries generated revenues by printing money, thereby eventually producing hyperinflations. As Sargent documents, the hyperinflations ended when fiscal reform allowed budget deficits to be reduced.

The U.S. experience

Obviously, the U.S. has never faced conditions as extreme as those discussed above. The chart presents data on the behavior of the fiscal deficit and the inflation rate in the U.S. from 1914 to 1986. The beginning date coincides with the founding of the Federal Reserve. In order to adjust for the growth in the U.S. economy over this period, the deficit has been scaled by nominal GNP. The chart is dominated by large deficits during the two world wars; inflation was also relatively high during these periods. These episodes do seem to suggest that budget deficits are accompanied by expansionary monetary policy. A more formal, econometric study by economist Douglas Joines also finds that wartime government expenditures lead to an increase in money growth.

The U.S. Federal Budget Deficit* and Inflation



*Budget deficit is shown as a percent of GNP.

However, there is little evidence of a positive relationship between inflation and deficits at any other time. In particular, the post-World War II period, which has been the focus of most recent empirical work on the deficit-inflation relationship, shows a divergence between the two. Specifically, the inflation rate picked up in the 1960s, reached a peak around 1980, and then declined. On the other hand, deficits (as a percent of GNP) were not very large until the 1970s, and have increased in a sustained fashion almost exactly at the time that inflation has peaked and then subsided. Thus, for the post-war period, the chart does not provide much evidence to suggest that deficits are associated with higher inflation.

Of course, the evidence presented in the chart is only meant to be suggestive. A large number of formal studies have attempted to determine whether a relationship exists between deficits and inflation, generally by estimating reaction functions for the Federal Reserve. Overall, however, evidence from the post-war period does not suggest any clear-cut relationship between deficits and inflation. While some studies have found a positive relation between the two, others either fail to find a significant relationship, or find that the estimated relationship changes when the sample period is changed slightly. Economists Robert King and Nelson Plosser, for instance, find that while there does appear to be a positive correlation between inflation and deficits, this correlation disappears when other influences on the inflation rate are taken into account.

In general, then, the evidence does not suggest that there is any short-run relationship between deficits and inflation in the U.S. But what about the long-run relationship between fiscal deficits and money growth implied by the government's budget constraint? Work done at this Bank suggests that the behavior of deficits over time does not violate the government's budget constraint. However, this evidence does not necessarily support the notion of fiscal dominance, since the budget constraint can be satisfied by increasing taxes or cutting expenditures, and need not be met by printing money.

Interpreting the U.S. experience

There are at least two plausible explanations for the lack of a connection between fiscal deficits and inflation. First, on a theoretical level, some economists maintain that even if the Federal Reserve acts to smooth interest rates, deficits will not automatically lead to faster money growth because, they believe, deficits do not push up interest rates. They argue that the public knows higher government expenditures relative to revenues today will require an increase in taxes in the future. As a result, the public will increase saving and set aside funds today in order to meet the expected higher future taxes. Consequently, an increase in fiscal deficits will be met by a corresponding increase in saving, and there will be no upward pressure on interest rates that could induce the Fed to pursue an inflationary monetary policy.

On the other hand, if deficits do affect interest rates, the U.S. evidence suggests that the Fed has not acted to offset these effects. In other words, Fed policy over this period has been conducted independently of changes in the deficit. Indeed, many observers agree that the Federal Reserve enjoys a high degree of political independence.

Once again, the existence of an independent monetary authority is not inconsistent with the finding that the government's budget constraint is satisfied over the long run. As mentioned above, if the monetary authority is politically dominant, then fiscal policy will have to adjust to the money growth rate set by the monetary authorities. Other outcomes are possible as well. For example, some economists have suggested that the fiscal and monetary authorities could "cooperate" to jointly determine the tax rate and inflation. These theories imply that instead of deficits causing inflation, the two are jointly determined by other factors such as changes in government expenditures. We will examine such theories in a subsequent *Letter*.

Not in the U.S.

There are at least two channels through which high budget deficits plausibly can lead to inflation. Moreover, the historical experience of several countries illustrates what can happen when governments resort to the printing press to pay off their bills. However, the evidence for the U.S. over the post-war period does not suggest that the monetary authority has been placed in such a situation. Thus, in the U.S., there is little evidence to suggest that large fiscal deficits have led to higher inflation.

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